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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GOPALAN RAMANUJAM

Appeal 2009-002483
Application 10/658,612
Technology Center 2100

Before: THU A. DANG, CAROLYN D. THOMAS, and
DEBRA K. STEPHENS, *Administrative Patent Judges*.

STEPHENS, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

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[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the "MAIL DATE" (paper delivery mode) or the "NOTIFICATION DATE" (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

Appellant appeals under 35 U.S.C. § 134(a) (2002) from a final rejection of claims 1-25, 32 and 33. We have jurisdiction under 35 U.S.C. § 6(b) (2008).

We AFFIRM.

Introduction

According to Appellant, the invention is a system and method for processing apparatus and associated software and software sequences that perform mathematical operations. (Spec. 2). A first packed formatted value selected from a set of packed formatted values is converted into a plurality of second format values (Abstract).

STATEMENT OF THE CASE

Exemplary Claims

Claims 1, 20, and 32 are exemplary claims and are reproduced below:

1. An apparatus comprising:

> a destination storage location corresponding to a first architectural register;
>
> a functional unit to process a packed format values by converting, responsive to a control signal, a first packed first format value in a first format selected from a first plurality of packed first format values in the first format to a first plurality of second format values, said first packed first format value having a plurality of sub elements each having a first number of bits, each of the first plurality of second format values being a number represented in a second format and having a second number of bits which is greater than the first number of bits, said functional unit to store all of said first plurality of second format values into said first architectural register.

20. A method comprising:

a module fetching a first instruction that specifies a location of a first format value in a first format among a plurality of first format values of a packed data, the first format value having a plurality of sub elements each sub element having a first number of bits;

a functional unit processing the first format value by converting the first format value to a first plurality of second format values in a second format, each of the first plurality of second format values having second format and corresponding to one of the plurality of sub elements, the second format having a multiple of the first number of bits;

storing the first plurality of second format values into a first register.

32. A tangible machine readable medium carrying an Instruction, which if executed by a machine, causes the machine to perform the operations of:

converting an integer value, the integer value being among a plurality of integer values of a packed data and having a first integer format having a plurality of sub elements each having a first number of bits, to a plurality of floating point values; each of the plurality of floating point values having a first floating point format, the first floating point format having a multiple of the first number of bits;

storing the plurality of floating point values into a first register.

Prior Art

No prior art is relied upon by the Examiner in the rejection of the claims on appeal.

Rejections

Claims 1-25, 32, and 33 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter (Ans. 3). Claims 26-31 are allowed (Final. Rej.).

GROUPING OF CLAIMS

(1) Appellant argues claims 1-19 (independent claim 15 included) as group on the basis of claim 1 (App. Br. 9-13). We select independent claim 1 as the representative claim. We will, therefore, treat claims 2-19 as standing or falling with representative claim 1.

(2) Appellant argues claims 20-25 as a group on the basis of claim 20 (*id.* at 13-15). We select independent claim 20 as the representative claim. We will, therefore, treat claim 21-25 as standing or falling with representative claim 20

(3) Appellant argues claims 32 and 33 as a group on the basis of claim 32 (*id.* at 15-17). We select independent claim 32 as the representative claim. We will, therefore, treat claim 33 as standing or falling with representative claim 33.

We accept Appellant's grouping of the claims. *See* 37 C.F.R. § 41.37(c)(1)(vii).

ISSUE 1

35 U.S.C. § 101: claims 1-19

Appellant argues their invention is not non-statutory subject matter because the invention as recited produces a useful, concrete, and tangible

result; pertains to apparatus having "specific structured limitations;" and is limited to a practical application (App. Br. 9-13).

The Examiner finds the claims are a mathematical algorithm and the result is numbers (Ans. 4). The Examiner elaborates by finding the invention merely involves calculations and manipulations of data in performing a mathematical operation on a list of numbers to produce a numerical result (*id.*). Thus, the Examiner finds the invention as recited does not have practical application and concludes it is directed toward non-statutory subject matter (Ans. 4-5).

Issue 1: Has the Examiner erred in finding claims 1-19 are directed toward non-statutory subject matter?

FINDINGS OF FACT (FF)

Appellant's Invention

(1) A first register 120 and a second register 125 are a portion of a register file 122 (Spec. 7, [0028] and Fig. 1). During a conversion process performed according to one embodiment of a convert instruction, sub elements of a second packed data element are converted into a floating point number, and stored in a destination register 320 (Spec. 13-14, [0049]).

(2) The convert instruction is processed by one or more decoders 220 (Spec. 10, [0035]). The decoder may generate a micro operation as its output or other instructions, microinstructions, or control signals which reflect the original convert instruction (*id.*).

(3) A functional unit 130 operates responsively to control signals (Spec. 8, [0031]). The functional unit 130 may receive a control signal 135 and in response, access one of four packed data elements of a register 125 (*id.*). The functional unit converts a value B from a first format (F1) into a plurality of values in a second format (F2) (Spec. 8 and 9, [0034]). The plurality of values in then stored in a second register 120 (*id.*).

ANALYSIS

After considering the totality of the circumstances before us, we find the Examiner did not err in concluding claims 1-19 recite non-statutory subject matter.

Appellant argues because the claims recite an apparatus, the claim recites a specific machine (App. Br. 12). "[A] machine is a concrete thing, consisting of parts, or of certain devices and combination of devices. This includes every mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result." (*In re Ferguson*, 558 F.3d 1359, 1364 (Fed. Cir. 2009) (citations and quotations omitted).) Nominal recitations of structure, such as non-limiting preamble recitations, are insufficient to bring a claim within the scope of statutory subject matter. (*Cf. Ex parte Langemyr*, 89 USPQ2d 1988, 1996 (BPAI 2008) (informative).) Claim 1 must be construed in its entirety. (*See Catalina Marketing Int'l, Inc., v. Coolsavings.com Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002).)

Appellant points to the recited elements of "a destination storage location," "a decoder" and "a functional unit" (App. Br. 5, 6 and 12);

however, we do not find any of these elements recites hardware, a device, or any physical element (App. Br. 5 and 6; Figs. 1, 2a, and 3a; and FF 1, FF 2, and FF 3). Accordingly, we conclude that these elements, having no structural limitations, are concepts, not components. Without limiting structure, the claims are not limited to machines or manufactures. Appellant has not identified any structure for "a destination storage location" or a "decoder," but instead, points to a register file and a block that may perform functions (App. Br. 5, 6, and 12; Reply Br. 3-4). Appellant also similarly fails to provide any persuasive evidence or argument that a "functional unit" is a physical element instead pointing to the claim language and the possible function of the functional unit (App. Br. 5, 6, and 12).

The lack of structure in the claim limitations is accentuated by the lack of structure in the Specification (Figs. 1, 2a, and 3a; FF 1, FF 2, and FF 3). The claimed apparatus and system are diagrammatically illustrated as a set of blocks (Figs. 1 and 2a). These figures, and their accompanying descriptions, paint an abstract conceptual picture of what the invention is supposed to do. But these drawings do not provide a concrete explanation of what the invention actually is.

As a result, aside from the nominal preamble recitations, claims 1 and 15 lack concrete limitations. Indeed, by failing to include any structural or functional relationship between the destination storage location, decoder, and functional unit and the elements of a computer or other structure, we conclude one of ordinary skill in the art would have broadly but reasonably construed these elements to recite software. These claims to software per se encompass embodiments that do not permit the computer program functionality to be realized. (*Manual of Patent Examining Procedure*

(MPEP), § 2106.01 (8th ed., rev. 7, July 2008).) Accordingly, these claims are therefore directed to software per se, which falls outside the scope of patentable subject matter. (*See In re Warmerdam*, 33 F.3d 1360, 1361 (Fed. Cir 1994).)

For at least these reasons, we find no evidence persuasive of error in the Examiner's 35 U.S.C. § 101 rejection of claims 1 and 15, and claims 2-14 and 16-19 which fall therewith.

ISSUE 2

35 U.S.C. § 101: claims 20-25

Appellant asserts the recited invention is statutory subject matter because the invention as recited produces a "useful, concrete, and tangible result" and is limited to "a practical application" (App. Br. 13-15).

Issue 2: Has Appellant shown the Examiner erred in concluding claims 20-25 recite non-statutory subject matter?

FINDINGS OF FACT (FF)

Appellant's Invention

(4) In an alternative implementation of a processor, a first module 295 receives or fetches instructions in a first Instruction Set Architecture (ISA) (Spec. 12, [0041] And Fig. 2c).

ANALYSIS

As discussed above with respect to Issue 1, we conclude a functional unit lacks structure. Similarly, we conclude "a module" lacks any structure.

Based on the record before us and Appellant's references to where this element is disclosed in their Specification (App. Br. 6), we find no error in the Examiner's non-statutory subject matter rejection of claim 20. At first blush, claim 20 appears to recite a method and thus falls within a statutory class set forth in § 101. However, not every process claim is patent-eligible under § 101. (*See Bilski*, 95 USPQ2d 1001, 1009-10 (U.S. 2010) (discussing the process claims in *Gottschalk v. Benson*, 409 U.S. 63 (1972) and *Parker v. Flook*, 437 U.S. 584 (1978) being non-statutory under § 101).) To make this determination, we apply the machine-or-transformation test, which the Court has stated is a useful in determining whether a claim is a process under § 101. (*Bilski*, 95 USPQ2d at 1007.) The machine-or-transformation test states "an applicant may show that a process claim satisfies § 101 either by showing that his claim is tied to a particular machine, or by showing that his claim transforms an article into a different state or thing." (*In re Bilski*, 545 F.3d 943, 961 (Fed. Cir. 2008) (en banc), aff'd sub nom. *Bilski v. Kappos*, 95 USPQ2d 1001 (U.S. 2010).) The U.S. Supreme Court recently reaffirmed that "the machine-or-transformation test is a useful and important clue … for determining whether some claimed inventions are processes under § 101." (*Bilski v. Kappos*, 95 USPQ2d at 1007 ("Bilski").)

Claim 20 recites a method in which: (1) a module fetches a first instruction that specifies the location of a first format value; (2) a functional unit processing the first format value by converting it to second format values; and (3) storing the second format values into a register. Because the module, functional unit and storing are not tied to any machine, whether particular or otherwise, claim 20 does not satisfy the first prong of the machine-or-transformation test. Additionally, these steps (e.g., fetching,

processing, and storing) do not transform an article into a different state or thing.

Moreover, we conclude these concepts of fetching and processing data are not patentable processes but attempts to patent a mathematical algorithm –converting a value in one format to a value in another format.

We therefore find that the method recited in claim 20 and claims 21-15 which fall therewith, recites an abstract idea and is therefore non-statutory under § 101.

Thus, we conclude Appellant has failed to persuade us of error in the Examiner's conclusion that claims 20-25 recite non-statutory subject matter.

ISSUE 3

35 U.S.C. § 101: claims 32 and 33

Appellant asserts claim 32 is directed toward statutory matter since the invention as recited produces a useful, concrete, and tangible result; pertains to a "tangible machine-readable medium carrying an instruction;" and is limited to a practical application (App. Br. 14-16).

Issue 3: Has the Examiner erred in concluding that claim 32 is directed toward non-statutory subject matter?

ANALYSIS

Based on the record before us, we find no error in the Examiner's conclusion that claim 32 is directed toward non-statutory subject matter. Specifically, claim 32 recites a "tangible machine readable medium carrying

an instruction, which if executed by a machine, causes the machine to perform" operations. These operations include:

> converting an integer value, the integer value being among a plurality of integer values of a packed data and having a first integer format having a plurality of sub elements each having a first number of bits, to a plurality of floating point values, each of the plurality of floating point values having a first floating point format, the first floating point format having a multiple of the first number of bits; [and]
>
> storing the plurality of floating point values into a first register.

(Claim Appd'x; claim 32).

The subject matter of claims permitted within 35 U.S.C. § 101 must be a machine, a manufacture, a process, or a composition of matter. Moreover, our reviewing court has stated that "[t]he four categories [of § 101] together describe the exclusive reach of patentable subject matter. If the claim covers material not found in any of the four statutory categories, that claim falls outside the plainly expressed scope of § 101 even if the subject matter is otherwise new and useful." (*In re Nuijten*, 500 F.3d 1346, 1354 (Fed. Cir. 2007), reh'g en banc denied, 515 F.3d 1361 (Fed. Cir. 2008), cert. denied, 129 S. Ct. 70 (2008). *Accord In re Ferguson*, 558 F.3d 1359 (Fed. Cir. 2009).)

Laws of nature, abstract ideas, and natural phenomena are excluded from patent protection. (*Diamond v. Diehr*, 450 U.S. 175, 185 (1981)). A claim that recites no more than software, logic or a data structure (i.e., an abstraction) does not fall within any statutory category. (*In re Warmerdam*, 33 F.3d 1354, 1361 (Fed. Cir. 1994).) Significantly, "Abstract software code is an idea without physical embodiment." (*Microsoft Corp. v. AT&T Corp.*, 550 U.S. 437, 449 (2007)).

Indeed, except for the preamble, claim 32 recites code or software per se that is not statutory under §101. A machine readable medium can be considered a manufacture or machine under § 101. (*See Ferguson*, 558 F.3d at 1364 (explaining a "machine" is "a concrete thing, consisting of parts, or of certain devices and combination of devices.…[that] includes every mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result."); *see also In re Nuijten*, 500 F.3d 1346, 1356 (Fed. Cir. 2007) (explaining "[a] 'manufacture' (in its verb form) [is defined] as 'the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery'" and "[a]n 'article' [is] a 'particular substance or commodity.…'").)

Nonetheless, merely reciting data or instructions on a stored machine readable medium does not make a claim statutory under § 101. (*See Ex parte Langemyr*, 89 USPQ2d 1988, 1999 (BPAI 2008) (informative).) Similarly, merely placing instructions or code on a machine readable medium does not render claim 32 statutory.

Although Appellant contends that a machine-readable medium is statutory and cite *In re Lowry* 32 F.3d 1579, 1583 (Fed. Cir. 1994), *In re Beauregard*, 53 F.3d 1583 (Fed. Cir. 1995) and MPEP §2106.01 to support this contention (App. Br. 16), Appellant is mistaken as to the rigidity of these cases and procedure. In *Beauregard,* the court merely indicated that the Commissioner agreed that the printed matter doctrine was inapplicable under the specific facts of that case, and therefore no case or controversy

existed. *Id.* at 1584. Appellant's reliance on *Beauregard* is therefore unavailing.

Similarly, as Appellant indicates (App.Br. 16), MPEP § 2106 states that a machine readable medium having functional descriptive material is statutory in most cases. Thus, claim 32 is not necessarily statutory under § 101 just because the claim recites a machine readable medium. In this case, the elements recited in claim 32 do not recite a data structure or any interaction with a physical thing. Instead, claim 32 recites converting an integer value to a plurality of floating point values and storing the plurality of floating point values. While storing does store the values in a register, it does not functionally interrelate the medium so that this function or the converting function are realized.

Unlike the data structure recited in *Lowry*, the claims do not "require specific electronic structural elements which impart a physical organization on the information stored in memory," *Lowry* at 1583. Nor do the claims "simultaneously represent complex data accurately and enable powerful nested operation." *Id.* at 1584. Instead the claim recites a "process" embedded on a tangible machine readable medium that is so abstract and sweeping so as to cover both known and unknown uses of an integer to floating point conversion. (*See Gottchalk v. Benson* 409 U.S. 63, 64.)

Also, limiting the claim to machine-readable media does not add any practical limitation to the scope of the claim (over Appellant's rejected method claims). To permit such a practice would exalt form over substance and permit Appellant to circumvent the limitations contemplated by § 101. We therefore find that the claim 32, and claim 33 which falls therewith, are directed to non-statutory subject matter.

DECISION

The Examiner's rejection of claims 1-25, 32, and 33 under 35 U.S.C. § 101 as being directed to non-statutory matter is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv) (2009).

AFFIRMED

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